PRODUCTS FROM MATURED COCONUT WATER

Dr.(Mrs.) Satyavati Krishnankutty

Scientist, Regional Research Laboratory (CSIR), Thiruvananthapuram - 695 019

Coconut water is an important by-product of the coconut processing industry. A process has been developed for the upgradation and preservation of matured coconut water to tender coconut water level and bottling it as a soft drink. The coconut water can also be made into a good quality vinegar. To some extent, coconut water is used for making "nata de coco", a gelatinous dessert delicacy produced by the action of bacteria. Coconut water is also an important substrate of yeast production.

Coconut water is the liquid endosperm found in the fruit of coconut. In the early stages of development this water is sweet and refreshing. As the nut matures, the sweetness diminishes but retaining much of its chemical components. While tender coconut water is an important beverage in all the coconut producing countries, matured coconut water, a by-product of copra desiccated coconut and other coconut processing units such as partially defatted coconut, coconut cream, etc. is being wasted at present. It is estimated that about 250 million litres of coconut water is available from copra processing units in Kerala alone. A process has been developed at Regional Research Laboratory, Thiruvananthapuram for upgrading the matured coconut water to tender coconut water level and preserving it as a soft drink. By adopting suitable processing techniques and with permitted additives, a good quality bottled coconut water with adequate shelf-life at ambient temperature has been developed.

Chemical analysis of matured coconut water showed that it contained 5.4 per cent total solids, 3.0 per cent soluble sugars, 0.5 per-cent minerals, 0.1per cent protein, 0.1per cent fat, 60 mg per cent acidity and pH 5.2. The corresponding figures for tender coconut water of about 7 months maturity were 6.5 per cent, 5.7 per cent, 0.6 per cent, 0.01 per cent ,0.07 per cent, 120 mg per cent and 4.5. After sugars, minerals are the most important in terms of quantity and quality of coconut water. Among the individual minerals, potassium accounts for more than half of the mineral matter. The matured coconut water contained 247 mgper cent potassium; 48 mg per cent sodium; 40 mg per cent calcium; 15 mg per cent magnesium; 6.3 mg per cent phosphorus; 79 mg per cent iron and 26 mg per cent copper. The corresponding figures for tender coconut water of about 7 months maturity were 290 mg per cent; 42 mg per cent; 44 mg per cent; 10 mg per cent; 9.2 mg per cent; 106 mg per cent and 26 mg per cent. Thus it can be seen that matured coconut water also contains considerable amount of nutrients especially minerals. The utilization of coconut water as a soft drink can make use of this nutritious produce as well as add to the economic returns of the farmers in the coconut growing countries of the world.

The quality of matured and tender coconut water could be attributed to the difference between their chemical composition. A process has been developed for the upgradation and preservation of matured coconut water. The main operations involve collection, upgradation, pasteurization ,filtration and bottling. The entire operations have to be carried out under strict hygienic conditions. The process essentially consists of upgrading the flavour of matured coconut water to the level of tender coconut water by supplementation with additives including sugar and preserving by a judicious combination of heat-pasteurization and permitted chemicals.

Coconut water can be processed into vinegar after addition of sugar and fermentation with yeast and acetobacter. Since matured coconut water contains only 2 to 3 per cent sugar, fortification with sugar will be necessary for alcoholic fermentation. Raising the total soluble solids of the matured coconut water from 4 to 4.5° Brix to 10° Brix with addition of sugar, subsequent alcoholic fermentation be done by inoculating with yeast, *Saccharomyces cerevisiae*, Brewers' yeast or Bakers' yeast. After alcoholic fermentation is over in about 4 to 5 days the clear liquid can be siphoned off and inoculated with vinegar bacteria "acetobacter" by adding mother vinegar. Vinegar

can be made either by "slow process" or by "quick generator" process.

Coconut water has been recommended for the production of certain food products. The National Institute of Science and Technology, Philippines has developed a product from coconut water called "nata de coco", a gelatinous dessert delicacy produced by the action of bacteria. The "nata" when formed is cooked in thick syrup and often served with fruit salads. In India, the product is reported to have been introduced into the local market in Kerala State under the name "Coconut Salad". The product is prepared from matured coconut water by mixing sugar, acetic acid and a culture liquor made from pine apple at a stipulated proportion and by allowing the mixture to remain undisturbed for about 15 days. After this period, the white jelly-like thick surface growth which is produced by the action of the organism, *Acetobacter xylinium* is harvested, sliced, acid washed, boiled in sugar and preserved either in containers or bottles.

Coconut water is an excellent medium for the production of protein foods. There had been few attempts to grow food yeasts with coconut water. Recent work at the Tropical Products Institute, London has concentrated on using the well-established food yeast *Saccharomyces fragilis* for this purpose. This yeast was chosen because of its ability to assimilate glucose, fructose, sucrose and sorbitol, the four major carbohydrates present, and because it will grow at temperature upto 45°C, an important consideration for reducing cooling costs. *Saccharomyces fragilis* grow well on matured coconut water, yielding upto 0.54 g of dry yeast per gram of total sugar at 40°C. Only urea at a concentration of 1 g per litre need be added to the coconut water to achieve maximum yield; sufficient minerals and vitamins being naturally present. The yeast so produced, after washing and drying will have a pale cream appearance, little odour, a pleasant nutty taste and a good shelf-life. *Saccharomyces fragilis*, which contains 45 per cent protein, is a rich source of amino acids and vitamins. In coconut processing units where large number of coconuts are processed, it would be feasible to grow the food yeast for the production of protein.